

B 1,027,192

BERNICE
PAULSEN
BISHOP
MUSEUM
OF
POLYNESIAN
ETHNOLOGY
AND
NATURAL
HISTORY

OCCASIONAL
PAPERS

4

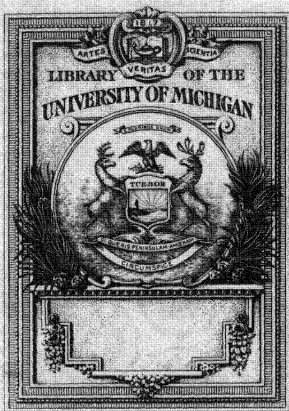
1906-11

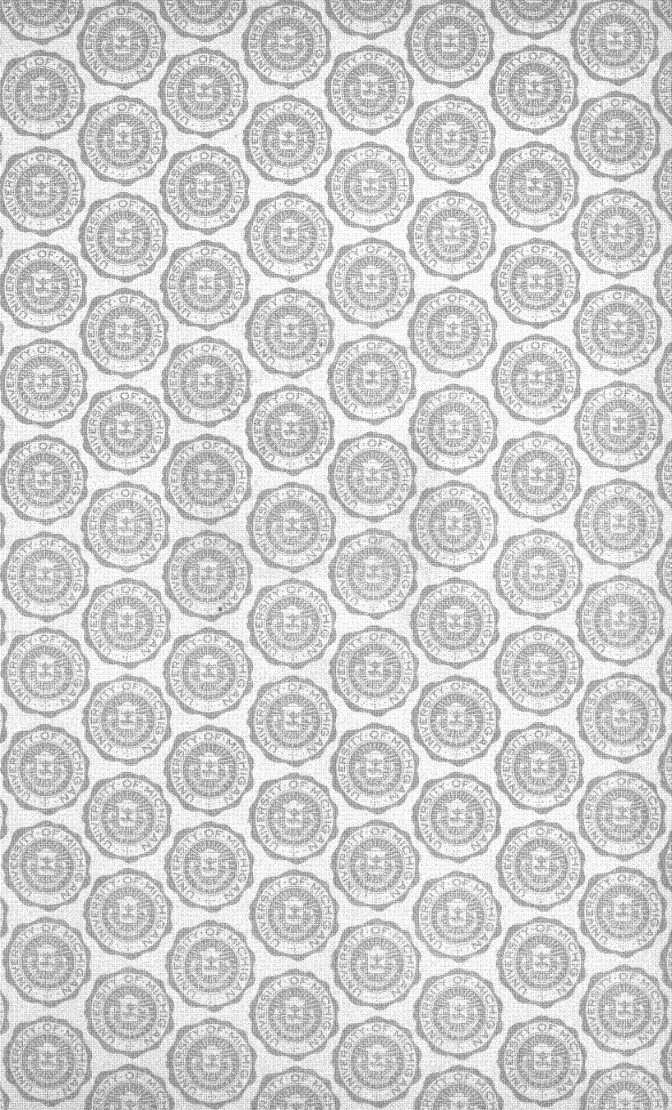
GN

670

.B53







GN

670

B53

OCCASIONAL PAPERS

OF THE

BERNICE PAU^uHI BISHOP MUSEUM, ^{*Honolulu*} (OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY.)

VOLUME IV.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1906-1911

BOARD OF TRUSTEES

ALBERT F. JUDD	President
E. FAXON BISHOP	Vice-President
J. M. DOWSETT.....	Treasurer
ALFRED W. CARTER.....	Secretary
HENRY HOLMES, SAMUEL M. DAMON, WILLIAM O. SMITH	

MUSEUM STAFF

WILLIAM T. BRIGHAM, Sc.D. (Columbia)	Director
WILLIAM H. DALL, Ph.D.	Honorary Curator of Mollusca
JOHN F. G. STOKES	Curator of Polynesian Ethnology
C. MONTAGUE COOKE, Ph.D. (Yale).....	Curator of Pulmonata
OTTO H. SWEZEY	Honorary Curator of Entomology
CHARLES N. FORBES	Curator of Botany
JOHN W. THOMPSON	Artist and Modeler
MISS E. B. HIGGINS	Librarian
JOHN J. GREENE	Printer
AUGUST PERRY	Assistant Printer

JAMES KALEI	Janitor
WILLIAM AIPU	Janitor

2. General

CONTENTS.

Number 1.

Fishes of the South Sea, by Alvin Seale.

Number 2.

Director's Report for 1907.

A list of Casts of Hawaiian Fishes, made by John W. Thompson of the Museum Staff.

Stone Sculpturings in Relief from the Hawaiian Islands, by John F. G. Stokes.

Some Birds of Molokai, by William Alanson Bryan.

Number 3.

Director's Report for 1908.

Walled Fish-traps of Pearl Harbor, by John F. G. Stokes.

Some New Hawaiian Plants, by Charles N. Forbes.

Number 4.

Director's Report for 1909.

Hawaiian Curved Adzes, by William T. Brigham.

Notes on Hawaiian Petroglyphs, by John F. G. Stokes.

New Hawaiian Plants, II, by Charles N. Forbes.

Summary of the Collection of Insects in the Museum, by Otto H. Swezey, M. S.

Number 5.

Director's Report for 1910.

Notes on the Naturalized Flora of the Hawaiian Islands, by Charles N. Forbes.

OCCASIONAL PAPERS

OF THE

BERNICE PAUAI BISHOP MUSEUM OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY.

VOL. IV.—No. 5.

Director's Report for 1910.

WITH
INDEX TO VOL. IV.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.
1911

TO THE TRUSTEES OF THE BERNICE PAUAAHI
BISHOP MUSEUM.

Sirs:—The present Report is presented in accordance with the new rules adopted by the Trustees on December 15, 1910. These rules read as follows:—

1. *Director's Annual Report.* While no definite instructions appear of record in the minutes from the Trustees to the Director regarding his Annual Report, the custom exists for the Director each year to present to the Trustees a written report of the work done in the Museum by the Director and the Staff, which report after acceptance by the Trustees is published. The Annual Report of the Director is a record of work accomplished. All recommendations by the Director looking toward the enlargement of the scope of the Museum or any increase in the field of the Staff's activities, should be made the subject of separate reports to the Trustees.

2. *Reports by members of the Staff.* At the close of each Museum year, each Curator shall report in writing to the Director concerning the work done by him or in his department during that year; plans for work in the future; and such other matters as he may desire to comment upon. These reports shall be transmitted to the Trustees by the Director, for filing in the Trustees' office.

Under these rules this report is submitted.

WILLIAM T. BRIGHAM,

Director of the Museum.

Honolulu, May 20, 1911.

Ordered printed October 19, 1911.

REPORT

DURING the whole year 1910, work on the new Laboratory building continued and on December 31, it was still incomplete. In spite of this necessary disturbance, the various departments made fair progress.

Mr. J. W. Thompson, our Modeler, has continued his very excellent work in casting the fishes and coloring these casts in a way that provoked from so competent a judge as President David Starr Jordan, the statement that these painted casts were far better than any paintings of fish he had seen for study and identification. The same authority pronounced our collection of Hawaiian fishes in casts of the greatest value. Many casts of fruit, and of stone and wooden implements, have also been made.

The record of the Printery is not impressive, although there has been no lack of good work; the only publication issued was the last Annual Report. This, in addition to the report, contained in the appendix illustrated articles on Hawaiian Curved Adzes by the Director; Notes on Hawaiian Petroglyphs, I, by the Curator of Polynesian Ethnology; New Hawaiian Plants, II, by the Curator of Botany. The Press has been busy on the many labels required by a growing Museum, and also on the third volume of the Memoirs, which was not completed by the end of the year, certain studies by the Director, on the Museum collection of kapa, having to await the accommodations of the new workrooms, this entailing a delay of six months in the publication of this volume.

In the Library, the increase has been both considerable and valuable, as may be seen by the list of accessions. Much binding of exchanges and other publications issued in parts, has been

accomplished by the liberal appropriations of the Trustees. In May, we lost the services of Miss Schupp, who had charge of the Library for several years, as she became Mrs. Paul Messchaert. Until September, when her successor took office, Mr. Stokes had charge. I would here record our entire satisfaction with Miss Schupp's work and the regret of the entire Staff at her departure. Miss E. B. Higgins has been Librarian since September, 1910.

In the department of Entomology, Mr. Swezey has done much work in arranging and relabelling the extensive collection of Hawaiian insects. He reports this as in good preservation.

In the department of Ethnology, Mr. Stokes has continued his researches on Hawaiian Fish-ponds and Walled Fish-traps, visiting Molokai and taking measurements and photographs from Kaumanamana to Kaluaaha on the southern coast. This investigation has been extended over the other Hawaiian islands, and by correspondence to the other Polynesian groups. I regard this work as of special importance as modern changes in the methods of fish capture and preservation, and the new demands of commerce and war preparation, are destroying these ancient constructions, and the knowledge of their use is fast vanishing from the memories of the old Hawaiians, and by the correspondence, we find that even on the other groups, little can now be gathered. In addition to the care of the Library as mentioned already, Mr. Stokes had entire charge of the Museum, during the absence of the Director from the islands, for five weeks.

Of the gifts to the Museum, one by Rev. W. D. Westervelt, of specimens in stone and pottery collected by him in Mexico, deserves special mention. Among the loan collections, is a very interesting one of relics of the Alii, deposited by Her Majesty Liliuokalani.

In the department of Pulmonata, Dr. Cooke reports the number of Pulmonata added to the collections during the year, was 24204 catalogued under 1811 numbers; 19501 by the Curator; 2368

by Mr. C. N. Forbes of the Staff; and 2335 by others. Forty-one days were spent in the field, and eighty-six localities visited on Molokai, Kauai and West Maui. Specimens were received from the following collectors:— Prof. H. E. Crampton, J. Waterhouse, I. Spalding, H. Meyer, D. Thaanum, E. Deverill, A. F. Judd, R. von Holt, C. H. and R. A. Cooke. Various papers on conchological subjects, have been contributed to Pilsbry's Manual of Conchology.

In the department of Botany, the field work includes a visit to Maui, extending from the latter part of May, to the early part of August, during which a week was spent in camping in the crater of Haleakala, where fine specimens of the Silversword were obtained in flower. The summit peak of West Maui was explored, also the valleys and ridges back of Lahaina and Wailuku and the Hana region, with Nahiku and the country between Keanae and Kipahulu. The Curator Mr. Forbes, reports his work much expedited by the kindness of Messrs. C. J. Austin, W. H. Field, H. J. Howell, C. E. Meyers, L. von Tempsky and W. Weinzheimer. On Oahu the field work has been mainly among the valleys and ridges of the western division. Exchanges have been continued with the Botanic Garden at Sydney, N. S. W., with Mr. E. D. Merrill of the Bureau of Science, Manila; with the Herbarium of Prince Roland Bonaparte, Paris. A valuable collection of 300 Philippine plants was purchased from the collector Mr. A. D. E. Elmer, who is making the most important collections in the Philippine Islands at present. Specimens have been added to the Herbarium also by Messrs J. M. Lydgate and J. W. Thompson.

The attendance for the year is smaller than last year by 834; the total of whites is 734 greater than last year, and there is an increase in all nationalities, except the Japanese who fall behind last year's record by 1885, accounting for the total deficit.

TABLE OF ATTENDANCE.

1910.	Whites.	Hawaiians.	Portuguese.	Chinese.	Japanese.	Others.	Open on		Visitors on closed days.	Average Attendance.		Total Visitors.
							Public days.	Other days.		Public days.	Other days.	
January	645	118	30	64	191	23	9	3	202	966	67	1071
February	728	186	41	352	106	10	9	4	19	156	5	1423
March	508	138	27	101	159	17	8	7	70	110	10	950
April	418	92	33	121	211	10	10	4	52	83	13	885
May	486	111	110	91	124	8	8	6	40	111	7	930
June	362	74	27	87	180	7	8	3	34	88	11	737
July	494	68	48	114	220	30	10	6	82	89	14	974
August	402	106	78	71	163	8	8	5	76	94	15	828
September	324	100	58	186	157	32	9	6	52	89	9	857
October	400	116	50	80	113	14	9	5	65	79	13	773
November	276	109	28	73	397	6	8	3	24	108	3	889
December	414	94	25	48	94	20	10	3	15	68	20	695
Totals	5457	1402	555	1388	2115	185	95	55	731	114.1	17.2	11,012

List of Accessions.

ENTHNOLOGICAL.

Gifts.

- 9133-9135 Specimens of carving from the Bontoc tribe. Philip-
pine Ids. Given by Mr. A. F. Judd.
- 9136 Devil house. Fiji. Given by Mr. J. A. Wilder.
- 9137 Meat hanger. Fiji. Given by Mr. J. A. Wilder.
- 9138 Club, lotus pattern. Fiji. Given by Master James
Wilder.
- 9146 Stone lamp. Molokai, H. I. Given by Mr. Wm.
Mutch.
- 9147 Stone mortar. Molokai, H. I. Given by Mr. Wm.
Mutch.
- 9150 Tapa. New Guinea Given by Mr. F. Muir.
- 9151-9152 Feather head-dresses. New Guinea. Given by Mr.
F. Muir.
- 9154 Cast of New Zealand feeding-funnel. Given by Mr.
H. G. Beasley.
- 9708 Stone hammer. Molokai, H. I. Given by Mr. G. P.
Cooke.
- 9709 Phallic Stone. Molokai, H. I. Given by Mr. G. P.
Cooke.

- 9710 2 Hawaiian cents, 1847. Given by Dr. W. T. Brigham.
10239 4 Hawaiian torches. Given by Kapiolani Estate Ltd.
10241-10248 8 Kahili. H. I. Given by Hon. A. S. Cleghorn.

Collection from Mexico. Given by Rev. W. D. Westervelt.

- 10101 8 knives of obsidian.
10102 4 knives or spear heads.
10103 4 spear heads.
10104 2 obsidian flakes.
10105-10106 Obsidian cores.
10107 Rubbing stone.
10108-10109 Axes.
10110 Spear head, quartz.
10111 Necklace, stone and shell beads.
10112-10113 Spinning whorls, or buttons, of stone or clay.
10114-10121 Spinning whorls, or buttons, of clay.
10122 Oblong bead.
10123 3 broken clay cups.
10124-10125 Tobacco pipes.
10126-10128 Incense burners.
10129 Hollow cylinder.
10130-10134 Handles to clay vessels.
10135-10155 Small human and animal heads in clay.
10157-10175 Idols, clay.
10176 Tortoise, modelled in clay.
10177-10180 Human figures, modelled in clay.
10181 Seal.
10182 Stone implement.
10183-10184 Tapa beaters of stone.
10185 Tapa beater of stone (cast).

Collection given by the Hawaiian Board of Missions.

- 10186 Drum. Marquesas Ids.
10187 Club. Marquesas Ids.
10188-10189 Staves of office. Marquesas Ids.
10190 Anklet of human hair. Marquesas Ids.
10191-10192 Stretchers for looms. Caroline Ids.
10193-10197 Dance wands. Caroline Ids.
10198 Dance paddle. Caroline Ids.

- 10199-10206 Spears, tipped with ray stings.
 10207 Mask for dancing. Mortlock Ids.
 10208 Fillets of Neritina shells. Mortlock Ids.
 10209-10210 Baskets. Gilbert Ids.
 10211 Adze handle. Marshall Ids.
 10212 Adze. Marshall Ids.
 10213 Adze or chisel, sharpened both ends.
 10214 Paddle. Gilbert Ids.
 10215 Club. Gilbert Ids.
 10216-10218 Coir armor. Gilbert Ids.
 10219 Sword. Gilbert Ids.
 10220 Coconut container.
 10221 Rattle of 3 Cassis shells.
 10222 Paddle. Micronesia.
 10223-10224 Wands. Micronesia.
 10225 Spear. Solomon Ids.
 10226 Club. Solomon Ids.
 10227 6 arrows. Solomon Ids.
 10228 Mask. New Caledonia.
 10229-10231 Ie kuku. Hawaiian Ids.
 10232 Hohoa. Hawaiian Ids.
 10233 Shells from squid hooks. Hawaiian Ids.
 10234 Skull.
 10235 Palm fibre.
 10236 3 coconut drinking cups.

Purchases.

- 9139-9140 Kapa anvils. Hawaiian Ids.
 9141 Stone sinker. Hawaiian Ids.
 9142 Kapuahi kuni anaana. Hawaiian Ids.
 9143-9144 Stone lamps. Hawaiian Ids.
 9145 Oil dish. Fiji.
 9711 Ivory comb. Hawaiian Ids.
 9712-9714 Stone mortars. Hawaii, H. I.
 9715-9716 Stone lamps. Hawaii, H. I.
 9717-9718 Stone adzes. Hawaii, H. I.
 9719 Eho pohaku. Hawaii, H. I.
 9720 Ulu maika. Hawaii, H. I.
 10237 Adze. Hawaii, H. I.
 10238 Cane covered with Hawaiian basketry.

Exchanges.

- | | |
|-----------|------------------------------|
| 9148 | Feather dress. New Guinea. |
| 9149 | Basket. South Australia. |
| 9153 | Taiaha. New Zealand. |
| 9155-9160 | Feather dresses. New Guinea. |

Loans.

Collection from Her Majesty Liliuokalani.

- | | |
|------------|---|
| L. 433 | Feather malo, of Kaumualii. |
| L. 434-437 | Feather lei, of Konia. |
| L. 438-443 | Lei palaoa. |
| L. 444 | Stone mirror, of Kalanikauleleiaiwi. |
| L. 445-446 | Stone mirrors, of Keaweikekahialiokamoku. |
| L. 447 | Ivory mounted mirror, of Keopuolani. |
| L. 448 | Ivory handle for cane, left by an officer of Captain Cook's vessel. |
| L. 449 | Ivory handle for fan, of Keopuolani. |
| L. 450 | Ivory handle for walking stick, called Kumahu-mahukolekolekaaka. |
| L. 451 | Ivory comb, of Keopuolani. |
| L. 452 | Tortoise shell comb, of Konia. |
| L. 453 | Jet ear-rings, of Konia. |
| L. 454 | Hair jewelry, of Konia. |
| L. 455-461 | Hair jewelry, of Paki. |

Collection from Mr. Bruce Cartwright, Jr.

- | | |
|------------|---|
| L. 462 | Feather lei, of Queen Emma. |
| L. 463-467 | Bone fish hooks. |
| L. 468 | Piece of fish jaw, probably used as a file. |
| L. 469 | Ivory bead. |
| L. 470 | Stone adze. Fiji. |
| L. 471 | Spear. Solomon Ids. |
| L. 472 | Bow. Solomon Ids. |
| L. 473 | 3 arrows. Solomon Ids. |
| L. 474 | Pumice for rubbing down wooden bowls. |

BOTANICAL.

J. M. Lydgate, Hawaiian plants	30
J. W. Thompson, Hawaiian plants	3
Botanic Garden, Sydney, by exchange, Australian plants..	200
A. D. E. Elmer by purchase, Philippine plants	300
Collected, Hawaiian plants.....	1776
Total additions.....	2309

CONCHOLOGICAL.

Charles N. Forbes	Specimens.....	2368
Others	"	2335
Curator collected	"	19501

Total accessions for the year 24204

New catalogue numbers 1811.

Specimens were received from those noted in the Director's report.

ADDITIONS TO THE LIBRARY.

Accessions denoted by an * were acquired by exchange.

*Academy of Natural Sciences of Philadelphia.—Proceedings, lxi, 3; lxii, 1, 2.—Journal, xiv, 2.

*Agricultural Gazette of New South Wales, xxi.

Aliiolani College.—Catalogue 1910-1911. Honolulu. Given by the College.

American Anthropologist, xi, 4; xii, 1, 2.

American Association for the Advancement of Science.—Preliminary announcement of 62nd meeting, 1910.

American Association of Museums.—Proceedings, iii. Charleston, 1909.

American Geographical Society, New York.—Bulletin, xli, 11.

*American Museum of Natural History, New York.—Annual Report, 1909.—Anthropological Papers, iv, 2; v, 1; vi, 1.—Bulletins, xxvii; xxviii.—Memoirs, viii, 2; x, 2; xii, 1; xiii, 1; xiv, 2.—American Museum Journal, x.

*American Philosophical Society, Philadelphia.—Proceedings, 193-196.

- Anatomy and Physiology, Journal of.—xliv, 2-4; xlv, 1.
- Anderson, Rufus.—Kapiolani. New York, 1866. Given by Dr. Wm. T. Brigham.
- Annuaire des Établissements Français de l'Océanie, Papeete, 1863.
- *Anthropologie de Paris, Revue de l'École d', vingtième année.
- *Anthropologie de Paris, Société de.—Bulletins et Mémoires, v série, ix, 6; x, 1; vi série, i, 1.
- *Archivio per l'Antropologia e la Etnologia. xxxix; xl, 1, 2.
- *Asiatic Society of Bengal.—Journal and Proceedings, iv, 5-11.—Memoirs, ii, 5-9.—Journal, lxxiv, 4.
- *Australian Museum, Sydney.—Report for 1909.—Records, vii, 5; viii, 1.—Memoirs, iii, 9; iv, 12.
- Bailey, F. Manson.—The Queensland Flora. Brisbane, 1899.
- Bailey, Florence Merriam.—The Red-headed Woodpecker.
- Becke, Louis.—Rodman, the boatsteerer. London, 1898. Given by Mr. A. F. Judd.
- The ebbing of the tide. Philadelphia, 1896. Given by Mr. A. F. Judd.
- By reef and palm. Philadelphia, 1896. Given by Mr. A. F. Judd.
- Scènes de la vie polynésienne. Paris, 1903.
- Becke, Louis and Walter Jeffery.—The mutineer. London, 1898. Given by Mr. A. F. Judd.
- A First Fleet Family. New York, 1896. Given by Mr. A. F. Judd.
- Bergh, R.—Untersuchung von Triboniophorus und Philomycus.
- Bernard, A.—L'Archipel de la Nouvelle Calédonie. Paris, 1894.
- Bonwick, James.—Daily life and origin of the Tasmanians. London, 1898.
- *Boston Public Library.—Bulletin, ii, 4.—Fifty-eighth annual report.
- *Boston Society of Natural History.—Proceedings, xxxiv, 8-11.
- Brazier, John.—Six papers on mollusca.
- Bronn's Klassen und Ordnungen des Tier-Reichs.—Mollusca, iii, 105-112.
- *Brooklyn Institute of Arts and Science.—Science Bulletin, i, 17; —Report for 1909.
- Brown, George.—Melanesians and Polynesians. London, 1910.
- Brown, J. MacMillan.—Maori and Polynesian. London, 1907.

- Buschman, J. Ch. Ed.—Textes marquésans et taïtiens. Berlin, 1843.
- Calder, J. E.—Native tribes of Tasmania. Hobart, 1875.
- *California Academy of Sciences, San Francisco.—Proceedings, iii, pp. 49-72.
- *Camboué, Rev. P.—Eight scientific papers.
- Caret, François d'Assise.—L'Archipel de Mangaréva.
- Carnegie Foundation for the Advancement of Teaching.—Bulletins, 4, 5; 4th Annual Report.
- Carnegie Institute, Pittsburg.—Founder's day, 1910.
- *Carnegie Institution of Washington.—Year book, 1909.—Publications, 53, 74 (1, 2), 87 (2), 96 (2), 100, 109, 115, 116, 121-126, 129, 135, 136.—Scope and Organization of the Carnegie Institution, 1909.
- *Carnegie Museum, Pittsburg.—Annals, vi, 2-4; vii, 1.—Memoirs, iv, 2, 5.—Annual report for 1910.
- Cauvin, Ch.—Mémoire sur les races de l'Océanie. Paris, 1882.
- Christian, F. W.—Eastern Pacific lands. London, 1910.
- Churchill, Hewella Pierce.—Samoa 'Uma. New York.
- Cincinnati Museum.—Annual reports, 1908, 1909.—Exhibitions of American Art, 3 catalogues.
- Collinge, Walter E.—Five papers on mollusca.
- *Connecticut Academy of Arts and Science, New Haven.—Transactions, xiv, pp. 291-466; xvi, pp. 1-245.—Memoirs, ii.
- Cooke, George.—Te pito te henua. Washington, 1897.
- Cook,—Journal of Cook's last voyage. Philadelphia, 1783.
- Cooper, H. Stonehewer.—Coral lands. London, 1880.
- Cox, James C.—Two papers on mollusca.
- Creagh, S. M.—Loyalty Islands. Hobart, 1892.
- Crocker, H. I.—Hawaiian numerals. San Francisco, 1909. Given by Hon. C. R. Bishop.
- Dictionaries.—Dutch-English, Holtze. Leipzig, 1899.
- English-Greek, Yonge.
- English-Hawaiian, Lahainaluna, 1845.
- English-Latin, Smith and Hall. New York, 1871.
- French-English and English-French, Edgren. New York, 1904.
- German-English and English-German, Flügel. Braunschweig, 1894.

- Greek-English, Liddell and Scott. New York, 1882.
—Harper's Latin. New York, 1907.
—Italian-English and English-Italian, Edgren. New York, 1904.
—Spanish-English and English-Spanish, Velasquez.
—Supplement to the Century Dictionary and Cyclopedia, New York, 1910.
Döllinger, J. I.—The Gentile and the Jew. London, 1906.
—The first age of Christianity and the Church. London, 1906.
*Dominion Museum, Wellington, N. Z.—Hand-lists: Birds inhabiting New Zealand, parts 1, 2; Lepidoptera of New Zealand.
Drago, Giovanni del.—Vingt jours à Honolulu. Rome, 1885.
Duggar, Benjamin Minge.—Fungous diseases of plants. Boston, 1909.
Durandus, William.—The symbolism of churches. London, 1906.
Ella, S.—Samoa. Hobart, 1892.
Ellis, William.—Polynesian researches. London, 1840.
Ellis, John E.—Life of William Ellis. London, 1873.
Exporters' Encyclopædia. New York, 1910
Farmer, Sarah S.—Tonga and the Friendly Islands. London, 1855.
Fergusson, James.—Rude stone monuments. London, 1872.
*Field Museum of Natural History.—Geological Series, iii, 8.—Ornithological Series, i, 6.—Zoological Series, vii, 8-12; x, 2-4.—Report Series, iii, 4.
Fison, Lorimer.—Group marriage and relationship. Hobart, 1892.
Fraser, J. G.—Totemism and Exogamy. London, 1910.
Furness, W. H. 3rd.—The island of stone money. Philadelphia, 1910.
Geographen Kalender. Gotha, 1909.
Giglioli, H. H.—Ethnological collection of Dr. Elio Modigliani. Leiden, 1893.
Glandeaud, Ph.—Les Volcans d'Auvergne. Paris, 1909.
Grey, G.—Mythology and traditions of the New Zealanders (in Maori). London, 1854.
—Poetry of the New Zealanders (in Maori). Wellington, 1853.
Hamy, E. T.—Les Races Humaines de Madagascar. Paris, 1895.
—Les Alfours de Gilolo. Paris, 1877.

- *Harvard University Library.—Twelfth report.
Hawaiian Annual, 1910.
- Hawaiian Entomological Society.—Proceedings, ii, 3. Given by the Society.
- *Hawaiian Evangelical Association.—Annual report for 1910.
- Hawaiian Legislature, Special session, 1909.—Message of the Governor.
- *Hawaiian Sugar Planters Association.—Division of Agriculture and Chemistry, Bulletins, 30-35.—Division of Entomology, Bulletins, 8, 9.—Division of Pathology and Physiology, Bulletins, 8, 9.—Report for 1909.
- Hawaii.—Report of the Governor of Hawaii for 1909. Washington, 1909.
- Report of the Milk Commission to the Governor of Hawaii, 1910.
- Report of the Commission on private wharfs and landings to the Governor of Hawaii, 1910.
- Hawaii Collegian, i, 1. Given by Professor Vaughan MacCaughey.
- Heilprin, A.—The eruption of Pelée. Philadelphia, 1908.
- Historisches Museum in Bern.—Jahresbericht, 1909.
- Houston Museum and Scientific Society.—Bulletin, 1.
- Imperial Earthquake Investigation Committee, Tokyo.—Bulletins, i, 1, 2, 4; ii; iii; iv, 1.
- *Indian Museum, Calcutta.—Annual report, 1908-1909.—Records, ii; iii, 1-3.—Memoirs, i, 4; ii, 1-3.—Echinoderma, part 5.—Ethnographic Survey, Craniological data.—List of Asiatic beetles.
- Inman, Thos.—Ancient Pagan and modern Christian symbolism. New York, 1874.
- Institut de Sociologie, Solvay.—Bulletin, 1.
- *Instituto Geológico de México.—Bolletín, 25.—Parergones, iii, 3-5.
- *Instituto de Maguinhos, Rio Janeiro.—Memorias, i, 1; ii, 1.—Trabalhos pelo Dr. Aragao, 5; Dr. Chagas, 4; Dr. Cruz, 4; Dr. Faria, 1; Dr. Fontes, 1; Dr. Horta, 1; Dr. Lima, 1; Dr. Neiva, 2; Dr. Moses, 2; Dr. Peryassu, 1; Dr. Vasconcelles, 1; Dr. S. von Prowazek, 2; Dr. S. von Prowazek and Dr. H. de Beaurepaire, 2.
- *Jardin Botanique de Buitenzorg.—Icones Bogorienses, iv, 1.
- Jho-Pâle.—Le braconnage en rivières. Paris, 1906.
- Pêches, pêcheurs, pêché. Paris, 1904.

- Job, H. K.—Franklin gull. New York, 1910.
- Ker, Annie.—Papuan fairy tales. London, 1910.
- *Kongl. Vitterhets Historie och Antiquitets Akademien, Stockholm.—Fornvännen, 1909.
- *Königl. Zoologisches und Anthropologisch-Ethnographisches Museum, Dresden.—Abhandlungen und Berichte, xiii, 1.
- Krause, Eduard.—Vorgeschichtliche Fischereigeräthe. Berlin, 1904.
- Kubary, J. L.—Ethnographische Beiträge, 3te Heft. Leiden, 1895.
- Lang, J. D.—View of the origin and migrations of the Polynesian nation. London, 1834.
- Langley, S. P.—The fire walk ceremony in Tahiti. London, 1901.
- Lauffer, B.—Chinese pottery of the Han dynasty. Leiden, 1909.
- Lawes, W. G.—Motu grammar and vocabulary. Sydney, 1896.
- Le Hon, H.—L'homme fossile en Europe. Bruxelles, 1868.
- *Leland Stanford Junior University.—University Series, 3, 4.
- Lias, B. de S. P.—Pérak. Paris, 1883.
- *Linnean Society of New South Wales.—Proceedings, i-vi; xxxiv, 3, 4; xxxv, 1-3.
- *Liverpool School of Tropical Medicine.—Annals, iii, 5; iv, 1-2.
- Mallet.—Océanie.
- Man, ix, 12; x, 1-10.
- Manual of Conchology, 79-81.
- *Marine Biological Association.—Journal, viii, 5; ix, 1.
- Marsden, William.—The history of Sumatra. London, 1811.
- Martini und Chemnitz.—Conchylien Cabinet, Lieferungen 539-546.
- Massachusetts Horticultural Society.—Transactions, 1909, 2; 1910, 1. Given by Dr. Wm. T. Brigham.
- Matthews, R. H.—Australian rock pictures. Washington, 1895.
- Australian ground and tree drawings. Washington, 1896.
- McNab, Robert.—Murihiku. Wellington, 1909.
- Microscopical Science, Quarterly Journal, liv, 3, 4; lv.
- *Missouri Botanical Garden, St. Louis.—Annual report for 1909.
- Moehler, J. A.—Symbolism. London, 1906.
- Morgan, Lewis H.—Ancient society. New York, 1878.
- Murray, A. W.—Forty years mission work in Polynesia and New Guinea. London, 1876.
- *Museo Nacional de Buenos Aires.—Anales, serie iii, xi; xii.

- *Museum of Comparative Zoology.—Bulletin, lii, 14-17; liv, 1.
—Memoirs, xxxix, 1; xl, 1; xli, 1, 2.—Report, 1909-1910.
- *Museum of Fine Arts, Boston.—Bulletin, viii, 47, 48.
- *Natal Government Museum.—Catalogue of rocks and minerals, 1909.
Nature, lxxxii-lxxxv.
Nautilus, iv-xxiii; xxiv, 1-7.
Navas, Rev. P. Longinos.—Twenty-six entomological papers.
- *New South Wales, Department of Fisheries.—Annual report for 1909.—Fisheries of N. S. W., by David G. Stead.
- *New South Wales, Department of Mines.—Annual report for 1909.—Records of Geological Survey, ix, 1.—Memoirs, Paleontology, no. 5, vol. ii, pt. 2
- *New York Botanical Garden.—Bulletin, 21, 22, 24.
- *New Zealand Institute.—Proceedings, 1909, 3, 4; Transactions, xlii.
- Nova Guinea.—Résultats de l'expédition scientifique néerlandaise, viii, 2; ix, 1.
- *Oahu College.—Catalogue, 1909-1910.—The Oahuan, ix, 2, 5-10.
- Ornithologie, Journal für.—Jahrgang, lviii, 2-4. Sonderheft, Leipzig, 1910.
- Paradise of the Pacific.—Vol. xxiii.
- *Peabody Museum of American Archaeology, Cambridge.—Memoirs, iv, 3.—Papers, iv, 3.—Forty-third annual report.
- Peripatetic Parson.—Parts of the Pacific. London, 1896.
- Péron et Lesueur.—Le tablier des femmes hottentotes. Paris, 1883.
- Péron, M. F.—Voyage de découvertes aux terres australes. Paris, 1807.
- Petermanns Mittheilungen, lvi.
- *Philippine Journal of Science.—A, iv, 6; v, 1-4.—B, iv, 5, 6; v, 1-4.—C, iv, 5, 6; v, 1-4.—D, v, 1-3.
- *Philippine Bureau of Science, Division of Geology and Mines.—The Mineral resources of the Philippine Islands.
- Philippine Botany, Leaflets, 38-44.
- Philosophical Society of New South Wales, Sydney.—Transactions, 1862-1865.
- Planters' Record, i; ii, 1.
- Polynesian Society.—Journal, xviii, 4; xix.

- Pritchard, W. T.—Polynesian reminiscences. London, 1866.
- Quatrefages A. de—The Malay Archipelago, by A. R. Wallace.
- *Real Academia de Ciencias y Artes de Barcelona.—Boletín, iii, 1.
—Memorias, viii, 7-23.—Nomina del Personal Academico, 1909-1910.
- *Reale Accademia dei Lincei, Roma.—Atti, xviii (2° semestre) 6-9, 11, 12; xix (1° semestre); (2° semestre) 1, 3-12.—Memorie, vii, 9-12; viii, 1-6.—Rendiconto, ii, pp. 441-501.
- *Reale Scuola Superiore d'Agricoltura in Portici.—Bolletino del laboratorio di zoologia generale e agraria, iv.
- Rechinger, Karl.—Botanische und zoologische Ergebnisse.—3te Teil. Wien, 1910.
- Records of the Past, viii, 6; ix.
- Revue des Études Éthnographiques et Sociologiques.—Deuxième année, 21-23.
- Richards, William. L'Archipel des Iles Hawaii.
- *Rijks Ethnographisch Museum, Leiden.—Vorslag van den Directeur, 1909-1910 Katalog, Band, i, iv, v.
- Rocco, Sex mythology. London, 1908.
- *Royal Anthropological Institute, London.—Journal, xxxix, xl.
- *Royal Irish Academy.—Proceedings, section B, xxvii; xxviii, 1-8; section C, xxvii; xxviii, 1-12.
- Royal Microscopical Society.—Journal, 1910, part 4.
- *Royal Society of Edinburgh.—Proceedings, xxx, 1-6.
- *Royal Society of New South Wales.—Journal and Proceedings, xliii, 1-4.
- *Royal Society of Queensland.—Proceedings, xx, 1, 2.
- *Royal Society of South Australia.—Transactions and Proceedings and Report, xxxiii.—Memoirs, ii, 2.
- *Royal Society of Victoria.—Proceedings, xxiii, 1.—Transactions, v, 1.
- Saffre.—Archipel des Tonga, des Samoa, des Wallis, Ile Futuna, les Fidji.
- Saville, Marshall H.—The antiquities of Manabi. New York, 1910. Given by Professor Marshall H. Saville and George G. Heye, Esq.
- Schouten.—Voyage de Gautier Schouten aux Indes Orientales. Amsterdam, 1708.
- Scudder, W. H.—North American orthoptera. Cambridge, 1897.
- OC. P., B. P. B. M., VOL. IV, No. 5.—2. [317]

- Sellon, Edward.—Annotations on the sacred writings of the Hindus. London, 1902.
- Semper, Karl.—Die Palau-Inseln im stillen ocean. Leipzig, 1873.
- Smith, H. M.—Japanese goldfish. Washington, 1909.
- Smith, J. J.—Die Orchideen von Java. Heft 3. Leiden, 1910.
- *Smithsonian Institution.—Contributions to knowledge, 509.
- Bureau of American Ethnology.—Bulletins, 37, 45, 48, 49.
- United States National Museum, Bulletin 69, 71-74. Proceedings, xxxvii.
- United States National Herbarium, Contributions, xiii, 26; xiv, 1-2; xv.
- *Société Royal des Antiquaires du Nord.—Mémoires, 1908-1909.
- *Société Royale Zoologique et Malacologique de Belgique.—Annales, xlii-xliv.
- *South African Museum.—Annals, vi, 3. Report for 1909.
- Southal, James C.—The recent origin of Man. Philadelphia, 1875.
- *Staedt. Museum für Völkerkunde, Leipzig.—Jahrbuch, iii.
- *Staedt. Völker-Museum, Frankfurt a. M.—Strelow C., Die Aranda und Loritja Stämme in Central Australien.
- St. John, J. H. H.—Pakeha rambles through Maori lands. Wellington, 1873.
- Stokes, J. Lort.—Discoveries in Australia. London, 1846.
- Strong, William.—The story of the American Board. Boston, 1910.
- Taylor, Richard.—The past and present of New Zealand. London, 1868.
- *Technological Museum, Sydney.—Report, 1909.
- Thompson, A. S.—The story of New Zealand. London, 1859.
- Three years in the Pacific by an officer of United States navy. London, 1835.
- Thurston, Edward.—Castes and tribes of Southern India. Madras, 1909. Given by the author.
- Thurston, Lorrin A.—The liquor question in Hawaii. Honolulu, 1910.
- Tilden, Josephine.—Minnesota Algae, i. Minneapolis, 1910. Given by the author.
- Travel and Exploration, iii, 13, 14.
- *Tufts College Studies, iii, 1.
- *United States Agricultural Experiment Station, Honolulu.—Bulletin 19, 21.—Press Bulletin, 25-27. Annual report, 1909.

- United States Department of Agriculture, Washington.—Year book, 1909.—Farmers' bulletin, 396.—Forestry circulars, 117, 121, 158, 167, 179, 180, 182, 183.—Silvical leaflets, 12, 17, 20, 22.—Biological Survey: Bulletin, 34 part 2; 35.—Circular, 72, 73, 76.—North American Fauna, 31. Report for 1909.
- United States Department of Commerce and Labor, Bureau of Fisheries.—Bulletin, xxviii. Report of Commissioner for 1909.
- Statistical Abstract for 1909.
- The Foreign Commerce and Navigation for 1909.
- *United States Geological Survey.—Thirty-first annual report.—Bulletins, 381, 386, 389-393, 395-400, 402-416, 418, 419, 421-428.
- Water supply papers, 227, 233, 236-239, 241, 243-252.
- Professional papers, 65, 67, 68.
- Geologic Atlas, folios, 5, 16-56, 58-168.
- Mineral resources, calendar year 1908, parts 1, 2.
- *University of California.—Publications: American Archæology and Ethnology, v, 4, 5; vi; vii, 4, 5; viii, 6; ix, 1, 2.—Botany, iv, 1-6.—Chronicle, xi; xii, 1-4.—Physiology, iii, 17; iv, 1-3.—Zoology, v, 5-12; vi, 6-11; vii, 1.—Bulletin, iii, 3-8.
- University of Colorado.—Studies, vi, 2; vii, 1-4.
- University of North Dakota. Quarterly journal, i, 1.
- *University of Pennsylvania.—Contributions from the Zoological Laboratory, xv; Philology and Literature, xiii.
- *University of Pennsylvania Museum.—Anthropological publications, ii, 1; iii, 1.
- The Museum Journal, i, 1, 2.
- University of Upsala.—Geological Institution: Bulletin, ix, 17, 18; x, 19, 20; Index i-x.
- University of Washington.—Bulletin, i.
- Waitangi. Treaty of.—Wellington, 1892.
- Walker, H. W.—Wanderings among the South Sea Savages. London, 1909.
- *Wagner Free Institute of Science.—Transactions, vii.
- Warren Academy of Sciences.—Annual reports, 1907-1908.—Transactions, 1903-1907, i, 1.
- Westervelt, W. D.—Maui. Honolulu, 1910. Given by the author.
- Wilson Bulletin.—xxi, 2-4; xxii, 1, 2.
- Wistar Institute of Anatomy and Biology.—Bulletin, 2, 3.
- *Zeitschrift für Ethnologie.—xli, 6; xlii, 1-5.
- Zentralblatt für allgemeine und experimentelle Biologie.—Band, i, 14.

LIST OF EXCHANGES.

- Adelaide, S. Australia.—Royal Geographical Society of South Australia.
 Royal Society of South Australia.
 South Australian Museum.
- Amherst, Mass.—Amherst College Library.
- Amsterdam, Holland.—Universiteit van Amsterdam.
- Auckland, N. Z.—Auckland Institute.
- Baltimore, Md.—Johns Hopkins University.
 Maryland Geological Survey.
- Barcelona, Spain.—Real Academia de Ciencias y Artes de Barcelona.
- Berkeley, Cal.—University of California.
- Berlin, Germany.—Anthropologische Gesellschaft.
 Königl. Museum für Völkerkunde.
- Berne, Switzerland.—Bern Historisches Museum.
- Boston, Mass.—Boston Public Library.
 Boston Society of Natural History.
 Museum of Fine Arts.
- Bremen, Germany.—Museum für Natur-, Völker- und Handelskunde.
- Brisbane, Queensland.—Royal Society of Queensland.
- Brooklyn, N. Y.—Museum of the Brooklyn Institute of Fine Arts and Sciences.
- Brussels, Belgium.—Société Royale Malacologique de Belgique.
- Buda-Pest, Hungary. Museum National Hongrois.
- Buenos Aires, Argentine Republic.—Museo Nacional de Buenos Aires.
- Buitenzorg, Java.—Jardin Botanique de Buitenzorg.
- Calcutta, India.—Asiatic Society of Bengal.
 Indian Museum.
- Cambridge, Mass.—Harvard University Library.
 Museum of Comparative Zoology.
 Peabody Museum.
- Capetown, S. Africa.—South African Museum.
- Chicago, Ill.—Field Museum.
- Christchurch, N. Z.—Canterbury Museum.
- Cologne, Germany.—Rautenstrauch-Joest Museum.
- Copenhagen, Denmark.—Société Royale des Antiquaires du Nord.
- Dresden, Germany.—Königl. Zoologisches und Anthropologisch-Ethnographisches Museum.
- Dublin, Ireland.—Royal Irish Academy
- Edinburgh, Scotland.—Royal Society of Edinburgh.
- Florence, Italy.—Società Italiana di Antropologia.
- Frankfurt on Main, Germany.—Städtisches Völker-Museum.
- Geelong, Victoria.—Gordon Technical College.
- Genoa, Italy.—Museo Civico di Storia Naturale di Genoa.
- Halle, Germany.—Kaiserl. Leop. Carol. Akademie der Naturforscher.
- Hamburg, Germany.—Museum für Völkerkunde.
- Hanover, N. H.—Dartmouth College.
- Hilo, Hawaii.—Hilo Public Library.

- Honolulu, Hawaii.—Board of Agriculture and Forestry.
College of Hawaii.
Hawaiian Evangelical Association.
Hawaiian Historical Society.
Hawaiian Sugar Planters' Association.
Honolulu Library Association.
Oahu College.
United States Experiment Station.
- Lawrence, Kansas.—University of Kansas.
- Leiden, Holland.—Rijks Ethnographisches Museum.
Rijks Museum van Natuurlijke Historie.
- Leipzig, Germany.—Museum für Völkerkunde.
- Liverpool, England.—Liverpool School of Tropical Medicine.
- London, England.—Linnean Society of London.
Royal Anthropological Institute.
- Madras, India.—Government Museum.
- Manila, P. I.—Bureau of Science.
Ethnological Survey.
- Melbourne, Victoria.—Royal Society of Victoria.
- Mexico.—Instituto Geológico de Mexico.
- Munich, Germany.—Ethnographisches Museum.
- New Haven, Ct.—Connecticut Academy of Arts and Sciences.
Yale University Library.
- New Plymouth, N. Z.—Polynesian Society.
- New York, N. Y.—American Museum of Natural History.
Columbia University Library.
New York Botanical Garden.
- Oberlin, O.—Oberlin College.
- Para, Brazil.—Museu Goeldi.
- Paris, France.—École d'Anthropologie.
Société d'Anthropologie.
- Philadelphia, Pa.—Academy of Natural Sciences of Philadelphia.
American Philosophical Society.
Free Museum of Science and Art.
The Philadelphia Museums.
University of Pennsylvania.
University of Pennsylvania Museum.
Wagner Free Institute of Science.
- Pietermaritzburg, South Africa.—Natal Government Museum.
- Pittsburg, Pa.—Carnegie Museum.
- Plymouth, England.—Marine Biological Association of the United Kingdom.
- Portici, Italy.—Laboratorio di Zoologia Generale e Agraria.
- Rio de Janeiro.—L'Instituto de Maguinhos.
- Rome, Italy.—Accademia dei Lincei.
- St. Louis, Mo.—Missouri Botanical Garden.
- Salem, Mass.—Peabody Academy of Science.
- San Francisco, Cal.—California Academy of Sciences.

- São Paulo, Brazil.—Museu Paulista.
Stanford University, Cal.—Leland Stanford Junior University.
Stockholm, Sweden.—Kongl. Vitterhets Historie och Antiquitets Akademien.
Sydney, N. S. W.—Australian Museum.
 Department of Agriculture.
 Department of Fisheries.
 Department of Mines.
 Linnean Society of New South Wales.
 Royal Society of New South Wales.
 Technological Museum.
Tufts College, Mass.—Tufts College.
Vienna, Austria.—Anthropologische Gesellschaft in Wien.
 K. K. Naturhistorisches Hofmuseum.
Wanganui, N. Z.—Public Museum.
Washington, D. C.—Bureau of American Ethnology.
 Carnegie Institution of Washington.
 Library of Congress.
 Smithsonian Institution.
 United States Geological Survey.
 United States National Museum.
Wellington, N. Z.—Dominion Museum.
 New Zealand Institute.

[322]



Notes on the Naturalized Flora of the Hawaiian Islands.

BY CHARLES N. FORBES.

THE following plants are mainly species not recorded in Hillebrand's Flora,¹ the majority of them having probably become naturalized since 1886. The only record of the naturalized plants which we have had since that time is an addition of a few species in an article by Heller.² In order to make these notes complete these species are again mentioned in this paper. It is the intention to continue the notes at irregular intervals as material accumulates.

The naturalized flora occupies the lower valleys and plains, the number of indigenous plants in these localities at present being insignificant. This flora is rapidly encroaching on the native forest, especially where its conditions are changed by fires or grazing. Introduced weeds appear along new trails through the native forest in from two to three weeks in places where it would be impossible to find them before. In the unforested sections of the islands, as a large proportion of the slopes of Haleakala on Maui, naturalized plants occur to the very summit (10,000 feet). A few of the naturalized plants as *Crepis japonica* are an exception to the rule, in that they occur in the dense forest and are rarely found on the plains; and perhaps a few of the plants considered as indigenous may belong in this category.

¹ W Hillebrand. Flora of the Hawaiian Islands, 1888.

² A. A. Heller. Minnesota Botanical Studies, Bulletin No. 9, pp. 760-922. A portion of Heller's collections are in the Herbarium of the Bishop Museum.

FILICALES.

Ceropteris calomelanos (L.) Und.*Acrostichum calomelanos* L., Sp. Pl., ii, 1753, 1072.*Gymnogramma calomelanos* Kaulf., Enum., 1824, 76.*Ceropteris calomelanos* (L.) Und., Torr. Cl., 1902, 29, 632.

The silver fern is well established on all the islands, generally occurring along roadsides and irrigating ditches.

Ceropteris calomelanos var chrysophylla Link.*Gymnogramme chrysophyllum* Klff., Enum., 1824, 74.*Ceropteris chrysophylla* Link, Sp., 1841, 143.

The gold fern has the same distribution as the former but is less common. On Hawaii it was observed growing in the steam cracks at Kilauea.

HYDROCHARITACEAE.

Halophila ovata Gaud.*Halophila ovata* Gaud., Freyc. Voy. Bot., 1826, 430, t. 40. f.*Halophila ovalis* Hook., Fl. Tas., 1860, ii, 45.

Miss M. Reed showed me a specimen of this plant which she said was identified by Dr. W. A. Setchell. It occurs in brackish ponds in the vicinity of Honolulu.

LEMNACEAE.

Lemna minor L.*Lemna minor* L., Sp. Pl., 1753, 970.

The duck weed is common in ponds and taro patches on all the islands.

CHENOPODIACEAE.

Amaranthus spinosus L.*Amaranthus spinosus* L., Sp. Pl., 1753, 991.

A rather common weed on Oahu, probably occurring on other islands as well.

C. N. F., no. 1060. O. Nuuanu Valley.

POLYGONACEAE.

Rumex acetocella L.*Rumex acetocella* L., Sp. Pl., 1753, 338.

The sorrel occurs on all the islands and at all elevations. First reported from Kauai by Heller.

Rumex patentia L.

Rumex patentia L., Sp. Pl., 1753, 333.

A few specimens of this species were observed at Nahiku Landing, E. Maui. The plant also occurs as a weed in cane fields on Hawaii.

C. N. F., no. 265. M.

PORTULACACEAE,

Portulaca lutea Sol.

Portulaca lutea Sol., Ex Forst. f. Pl. Escul., 1786, 72. Seem. Fl. Vit., 9.

Portulaca flava DC., Prod., 1843, iii, 355.

This species occurs as a rather rare shore plant, probably on all the islands. This museum has specimens collected on Marcus, Midway and Laysan islands by W. A. Bryan, while it has been reported from Necker island by W. K. Fisher³ and from Hawaii by Dr. Guppy.⁴ It also occurs on Oahu near Kaena Point, and should be considered as indigenous.

C. N. F., no. 1650. O.

CARYOPHYLLACEAE.

Drymaria cordata (L.) Willd.

Holosteum cordatum L., Sp. Pl., 1753, 88.

Drymaria cordata Willd., Roem & Schultes, Syst. Veg., 1819, 5, 406.

Observed by Heller on Kauai. Occurs on all the islands.

Polycarpon tetraphyllum L.

Polycarpon tetraphyllum L., Sp. Pl., 1753, 881.

Observed at Makawao, E. Maui.

C. N. F., Aug. 1910. M.

Tissa marina (L.) Britton.

Arenaria rubra var marina L., Sp. Pl., 1753, 423.

Spergularia salina Presl., Fl. Cech., 1819, 95.

Buda marina Dumort, Fl. Belg., 1827, 110.

Spergularia media A. Gray, Man., 1867, 5, 95.

Tissa marina Britton, Bul. Torr. Club, 1889, 16, 126.

Buda marina var minor S. Wats., A. Gray, Man., 1890, Ed. vi, 90.

Near the beach in various places between Diamond Head and Koko Head on Oahu.

C. N. F., no. 1501. O.

³W. K. Fisher. Bul. U. S. Fish Commission, vol. xxiii, pt. iii, 1903, p. 807.

⁴H. B. Guppy. Observations of a Naturalist in the Pacific, vol. ii, p. 555.

RANUNCULACEAE.

Ranunculus parviflorus L.

Ranunculus parviflorus L., Sp. Pl., 1763, Ed. ii, 780.

In the forest below Kaalapuuwale on the slopes of Hualalai on the island of Hawaii, occurs a species of *Ranunculus* which I refer to the above. This diffuse plant with minute yellow flowers and hispid carpels covers many acres; mainly in the dead Koa forest, although some specimens were found in virgin forest. This place is also a locality for *R. mauiensis*, the two species often growing close together; while within a mile can be found *R. hawaiiensis*, the other native species. My determination is based on the description found in Britton and Brown's Flora of the Northern States and Canada.

C. N. F., no. 275. H.

ANONACEAE.

Anona cherimolia Mill.

Anona cherimolia Mill., Gard. Dic. Ed. viii, 1768, n. 5.

The cherimolia is well established on Hawaii, especially in the drier localities.

C. N. F., no. 365. H.

CRUCIFERAE.

Brassica campestris L.

Brassica campestris L., Sp. Pl., 1753, 666.

Rather common on Oahu, also occurring on the other islands. C. N. F., March 18, 1909. Moanalua Valley, Oahu.

Raphanus sativus L.

Raphanus sativus L., Sp. Pl., 1753, 669.

Rare, to be expected on all the islands. Mentioned by Hillebrand as occurring on Kauai.

C. N. F., April 6, 1909. Moanalua Valley, Oahu.

Sisymbrium officinale (L.) Scop.

Erysimum officinale L., Sp. Pl., 1753, 660.

Sisymbrium officinale Scop., Fl. Carn. Ed. ii, 1772, 2, 26.

The hedge mustard was first observed at Puuwaawaa on Hawaii, and later at various places on that island.

C. N. F., no. 9. H.

ROSACEAE.

Rosa sp.

A small flowered multi-petalled rose is well established on Hawaii and in certain places on Maui. On Hawaii it is known as the volcano rose, as it is especially common on the road to the volcano of Kilauea. Dr. W. T. Brigham observed this rose more than forty years ago along the trail to the Kapena Falls on Oahu; and he believes it may have been taken to the other islands from this locality. It has not become naturalized on Oahu.

Rubus jamaicensis L.

Rubus jamaicensis L., Mant., i, 1767, 75.

Rubus jamaicensis Sw., In Griesb. Fl. Brit. W. Ind., 1864, 231.

The so-called thimble-berry is common on Hawaii and in certain places on Maui. It is said to have been introduced from the West Indies.

Dr. W. T. Brigham & C. N. Forbes, Kilauea, 1908. C. N. F. no. 238. M. Keanae, Maui.

LEGUMINOSEAE.

Caesalpinia sappan L.

Caesalpinia sappan L., Sp. Pl., 1753, 381.

Found in gulches near Wahiawa, Oahu.

C. N. F., no. 1443. O.

Cassia chamaecrista L.

Cassia chamaecrista L., Sp. Pl., 1753, 379.

Common about Honolulu, Oahu.

Heller, no. 1969.

Cassia laevigata Willd.

Cassia laevigata Willd., Enum. Hort. Berol., 1813, 441.

Occurs on all the islands. Rather common on Oahu.

Heller, no. 2295.

Crotalaria fulva Roxb.

Crotalaria fulva Roxb., Fl. Ind., 1832, 3, 266.

Crotalaria saltiana Andr.

Crotalaria saltiana Andr., Bot. Rep., 1811, pl. 648.

Crotalaria striata DC., Prod., 1825, ii, 131.

Crotalaria spectabilis Roth.

Crotalaria sericea Retz. (not Burm.), Obs. Bot., 1779-91, 3, 26.

Crotalaria spectabilis Roth., Nov. Pl. Sp., 1821, 341.

The *Crotalaria*s form a conspicuous portion of the naturalized flora of the islands.

Fleminga strobilifera R. Br.

Fleminga strobilifera R. Br., Ait. Hort. Kew. Ed. ii, 1810-13, 350.

Fleminga bracteata Wight, Ic., 1840-53, 268.

Fleminga fruticulosa Wall, Cat., 1828, 5754.

Fleminga abrupta Wall, Cat., 1828, 5755.

I am indebted to Mr. C. J. Austin for showing me this plant. It occurs in company with *Psidium guajava* at Nahiku, East Maui. The plant is widely spread in India, where it is said to be very variable. It is a small shrub, and can be distinguished by the conspicuous folded bracts which hide the small flowers.

Medicago apiculata Willd.

Medicago apiculata Willd., Sp. Pl., iii, 1803, 1414.

Rather rare but probably has the same range as the next species. It can be recognized by the unarmed pods. In the Index Kewensis it is regarded as being synonymous with the next. C. N. F., no. 1718. O. Honolulu, Oahu.

Medicago denticulata Willd.

Medicago denticulata Willd., Sp. Pl., iii, 1803, 1414.

The bur clover is more or less common on all the islands. According to Van Dine,⁵ it was introduced on Maui in 1882.

Medicago intertexta Mill.

Medicago intertexta Mill, Gard. Dict. Ed. viii, 1768, n. 4.

The above species is reported to be common about Honolulu, by Heller.

Melilotus indica (L.) All.

Trifolium melilotus L., Sp. Pl., 1753, 764.

Trifolium indicum Thunb., Prod. Pl. Cap., 1800, 136.

Melilotus indica All., Fl. Pedem I, 1785-89, 308.

Melilotus parviflora Desf., Fl. Atlant., 1800, ii, 187.

Melilotus minima Roth., Nov. Pl. Sp., 1821, 361.

Melilotus occidentalis Nutt., ex Torr & Gray, Fl. N. Am., 1838, i, 321.

Melilotus regulosa Willd., Enum. Hort. Berol., 1809, 789.

Rather common on Oahu and Hawaii; probably on all islands.

Trifolium repens L.

Trifolium repens L., Sp. Pl., 1753, 767.

The white clover is common in the pastures on Haleakala, Maui.

GERANIACEAE.

Erodium cicutarium (L.) L'Her.

Geranium cicutarium L., Sp. Pl., 1753, 680.

Erodium cicutarium L'Her., Ait. Hort. Kew., 1789, 2, 414.

Oahu, not common.

⁵ Hawaii Agr. Exp. Station Rept., 1908, p. 25.

Geranium carolinianum L.

Geranium carolinianum L., Sp. Pl., 1753, 683.

This plant not only occurs on Hawaii as stated by Hillebrand; but is also common on Haleakala, Maui.

C. N. F., no. 218. M.

MALVACEAE.

Modiola caroliniana (L.) Don.

Malva caroliniana L., Sp. Pl., 1753, 688.

Modiola multifida Moench. Meth., 1791, 620.

Modiola caroliniana Don., Gen. Hist. Pl., 1831, i, 466.

Rather common on the slopes of Mauna Kea, Hawaii.

C. N. F., no. 458. H.

Two species of *Abutilon* not yet identified are very common on all the islands.

PASSIFLORIACEAE.

Passiflora edulis Sims.

Passiflora edulis Sims., Bot. Mag., 1818, 1989.

Sometimes plentiful, and to be expected in the forests of all the islands. Hillebrand says in his flora, 1871, "already escaped into the woods of East Maui." Native name, *liliko'i*.

Passiflora foetida L.

Passiflora foetida L., Sp. Pl., 1753, 959.

An occasional roadside plant.

ONAGRACEAE.

Epilobium Billardierianum ? Ser.

Epilobium Billardierianum Ser., DC. Prod., 1843, iii, 41.

A species of *Epilobium* which I have provisionally referred to the above, is very common on Haleakala.

C. N. F., no. 173. M.

UMBELLIFERAE.

Apium leptophyllum (DC.) F. Mull.

Sison Ammi L., Sp. Pl., 1753, 252.

Heliosciadium leptophyllum DC., Prod., 1830, iv, 105.

Apium leptophyllum F. Mull., Benth. Fl. Aust., 1866, iii, 372.

Apium Ammi Urban., Mart. Fl. Bras., 1879, ii, pt. i, 341.

First observed at Makawao, Maui. Not common on the islands.

C. N. F., Makawao, Maui.

Apium petroselinum L.*Apium petroselinum* L., Sp. Pl., 1753, 264.*Petroselinum sativum* Hoffm., Gen. Umb., 1814, 177.

Common parsley. A coarse leaved form occurs along irrigating ditches on West Maui. Reported from Hanapepe Valley, Kauai, by Heller.

C. N. F., no. 74. M. Wainee Gulch, Maui.

Foeniculum vulgare (L.) Gaertn.*Anethrum foeniculum* L., Sp. Pl., 1753, 263.*Foeniculum vulgare* Gaertn., Fruct. & Seem., 1788, i, 105.*Foeniculum foeniculum* Karst., Deutsch. Fl., 1880-83, 837.

The fennel is very common on Maui and in certain localities on Hawaii. Mentioned in Mann's Flora,⁶ but overlooked by Hillebrand.

PRIMULACEAE.

Anagallis arvensis L.*Anagallis arvensis* L., Sp. Pl., 1753, 148.

Occurs on all the islands.

LOGANIACEAE.

Buddleia asiatica Lour.*Buddleia asiatica* Lour., Fl. Cochinc., 72. Benth in DC. Prod., x, 416.

This plant is very common in the valleys of the Waianae range on Oahu, sometimes occurring as small trees six to ten feet high, while at other places it occurs as a subherbaceous plant of three to four feet. It also occurs in the dense forests of the Koolauloa range, and has all the appearances of an indigenous plant. One form is nearly glabrous.

C. N. F., Sept., 1908, Punaluu Mts. C. N. F., Makaha Valley, Kaala Mts., Feb. 12-19, 1909.

GENTIANACEAE.

Erythraea centaurium (L.) Pers.*Gentiana centaurium* L., Sp. Pl., 1753, 229.*Erythraea centaurium* Pers., Syn., 1805, i, 283.

This plant is well established on East Maui and Hawaii. It is generally found on grazing land.

C. N. F., no. 180. M. Paia, Maui.

⁶ Horace Mann. Flora of the Hawaiian Islands. Communications Essex Institute, Salem, Mass., vi, 1871.

CONVOLULACEAE.

***Ipomaea chryseides* Ker-Gaul.**

Ipomaea chryseides Ker-Gaul., Bot. Reg., 270.

Nuuanu Valley, Oahu. Not common.

C. N. F., no. 1360. O.

***Ipomaea grandiflora* Lam.**

Ipomaea glaberrima Boj., Hook. Journ. Bot., 1834, 357.

Ipomaea grandiflora Lam., Tab. Ency., i, 467. Roem. & Schult., Syst., iv, 240.

Dr. Guppy⁷ records his species for the first time from Hawaii. His localities were a mile west of Kapa-ahu and the coasts of Kalae. There are no specimens in this herbarium.

***Ipomaea peltata* Chois.**

Convolvulus peltatus L., Sp. Pl., 1753, 121.

Ipomaea peltata Chois., Conv. Or., (?), 70. DC. Prod., ix, 359.

This species were observed by Mr. J. M. Lydgate a number of years ago in Wainiha Valley on Kauai, and judging from the locality in which he observed it, he had no hesitation in calling it indigenous. The flowers of our plant are yellow and all the leaves are peltate.

J. M. Lydgate, Wainiha Valley, Kauai, 1909.

LABIATAE.

***Prunella vulgaris* L.**

Prunella vulgaris L., Sp. Pl., 1753, 600.

Very common on the cattle ranges of Haleakala, Maui. Also occurs on Hawaii but has not spread to any extent on this island.

SOLANACEAE.

***Cestrum diurnum* L.**

Cestrum diurnum L., Sp. Pl., 1753, 191.

This species has escaped from cultivation and has become established in several places on Oahu. Several species of *Cestrum* have been in cultivation on these islands for a long time. I have heard the name Chinese ink-berry applied to this plant.

***Nicotiana tabacum* L.**

Nicotiana tabacum L., Sp. Pl., 1753, 180.

Naturalized in various parts of Maui, especially on the north-east side.

⁷H. B. Guppy. Observations of a Naturalist in the Pacific, vol. ii, pp. 52, 554.

Solanum sodomium L.*Solanum sodomium* L., Sp. Pl., 1753, 187.

This African species is rather common on Oahu. First recorded by Heller.

ACANTHACEAE.

Thunbergia alata Boj.*Thunbergia alata* Boj., Sims. Bot. Mag., 2591.

A troublesome garden weed in Honolulu.

Thunbergia alata var **aurantiaca** Ktz.

This variety occurs as a roadside plant in Pauoa Valley on Oahu.

PLANTAGINACEAE.

Plantago lanceolata L.*Plantago lanceolata* L., Sp. Pl., 1753, 113.

This species usually occurs at rather high elevations, 2000 to 3000 feet. Observed on all the islands.

RUBIACEAE.

Sherardia arvensis L.*Sherardia arvensis* L., Sp. Pl., 1753, 102.

Maui, slopes of Haleakala.

C. N. F., no. 217. M.

CUCURBITACEAE.

Momordica charantia L.*Momordica charantia* L., Sp. Pl., 1753, 1009.

Met with on all the islands, especially in rather dry localities where it climbs over rocks and stone walls. Near Kailua on Hawaii, it covers acres of rough aa flows, and is regarded as a bad pest.

Another cucurbit with spiny fruits not yet identified is fairly common on all the islands.

COMPOSITAE.

Carduus lanceolatus L.*Carduus lanceolatus* L., Sp. Pl., 1753, 821.*Cirsium lanceolatum* Scop., Fl. Carn. Ed. ii, 1772, 2, 130.*Cnicus lanceolatus* Willd., Prodr. Fl. Berol., 1789, 259.

The common bur-thistle is well established on Hawaii and in several places on Maui.

C. N. F., no. 116. M. Hanaula W. Maui.

Chrysanthemum leucanthemum L.

Chrysanthemum leucanthemum L., Sp. Pl., 1753, 888.

Leucanthemum vulgare Lam., Fl. Fr., 1778, 2, 137.

The white daisy is rather common on Hawaii where it was observed growing on the slopes of Hualalai to the summit, and on the slopes of Mauna Loa.

Emilia flammea Cass.

Emilia flammea Cass., Dict. Sc. Nat., 1819, 14, 406.

A roadside plant on Oahu, first recorded by Heller. There are specimens in the Museum herbarium collected several years before Heller's collection.

Eupatorium sp.

A species of *Eupatorium* has lately become one of the most common plants on Maui.

C. N. F., no. 46. M. Hanakao, W. Maui. Dr. W. T. Brigham, Haleakala, E. Maui.

Hypochaeris radicata L.

Hypochaeris radicata L., Sp. Pl., 1753, 811.

Rather common on Haleakala, Maui, Probably on Hawaii. Reported from Kauai by Heller.

Lapsana communis L.

Lapsana communis L., Sp. Pl., 1753, 811.

Rather common on Maui and Hawaii.

Taraxacum officinale (L.) Weber.

Leontodon taraxacum L., Sp. Pl., 1753, 798.

Taraxacum officinale Weber, Prim. Pl. Holst., 1780, 56

Taraxacum dens-leonis Desf., Fl. Atlant., 1800, 2, 228.

Taraxacum taraxacum Karst., Deutsch. Fl., 1880-83, 1138.

The dandelion occurs on all the islands. It appears to have been introduced on the different islands from different sources. It has been observed on Kauai for at least twenty-five years, while a gentleman on Maui says it was introduced to that island very recently from New Zealand.

Zinnia pauciflora L.

Zinnia pauciflora L., Sp. Pl., 1753, Ed. ii, 1269.

This species in company with *Verbesina enceloides* (Cav.) A. Gray, is very common about the cane fields in the vicinity of Lahaina, Maui.

C. N. F., Aug., 1910.

ADDENDA.

FICOIDEAE.

Tetragonia expansa Murr.*Tetragonia expansa* Murr., Comm. Gotting., 1783, vi, 13.*Tetragonia halimifolia* Forst., Prod. 1786, 39.*Tetragonia cornuta* Gaertn., Fruct., 1788, ii, 483.*Tetragonia inermis* F. Mull., Linnaea., 1852, xxv, 384.*Tetragonia quadricornis* Stokes, Bot. Mat. Med., (?), iii, 127.

This plant, generally known as the New Zealand Spinach was collected on the beach near Makapu point on Oahu. This is one of the localities where logs from the north-west coast of America are washed on to the beach. The plant is rather widely distributed on the shores of the Pacific, and has been cultivated in Europe.

C. N. F., no. 1406. O.

COMPOSITAE.

Senecio vulgaris L.*Senecio vulgaris* L., Sp. Pl., 1753, 867.

The groundsel probably occurs on all the islands. It generally grows in partly forested sections. There are specimens in the herbarium from Maui, Hawaii and Oahu.

C. N. F., nos. 202. M. and 1695. O.

[334]

INDEX TO VOLUME IV.

The pagination of the volume will be found at the bottom of the page.

An asterisk denotes that the species or article is figured.

- Abudefduf amabilis*, 54.
 behni, 53.
 *caesio**, 53.
 coelestinus, 52.
 *Jordani**, 53.
 leucopomus, 54.
 multifasciatus, 53.
 saxatilis, 54.
 septemfasciatus, 53.
 sordidus, 53.
 taupo, 54.
 uniocellatus, 54.
 zonatus, 55.
Abutilon sp. (2), 329.
Acanthochromis polyacanthus, 55.
Acanthurus garretti, 67.
 unicornis, 67.
Acridotheres tristis, 147.
Acrostichum calomelanos, 324.
Æstrelata sandwichensis, 137.
Alauda arvensis, 147.
Albula vulpes, 5.
Alticus saliens, 88.
Amakihi, 160.
Amaranthus spinosus, 324.
Amblyapistus tænianotus, 83.
Amia amboinensis, 32.
 aroubiensis, 33.
 novemfasciata, 32.
 savayensis, 33.
Anagallis arvensis, 330.
Anampses cæruleopunctatus, 55.
Anas wyvilliana, 144.
Anethrum fœniculum, 330.
Anguilla megastoma, 5.
Anomalops palpebratus, 20.
Anona cherimolia, 326.
Antennarius commersonii, 89.
 hispidus, 89.
*Antennarius leutescens**, 89.
Apapane, 158.
Apium ammi, 329.
 leptophyllum, 329.
 petroselinum, 330.
Arenaria rubra, 325.
Asio accipitrinus sandwichensis, 146.
Atherina lacunosa, 15.
Attendance of visitors, 1907, 100.
 1908, 182.
 1909, 233.
 1910, 305.
Auku killed by mongoose, 145.
Aulostomus valentini, 17.
Australian coll., W. R. Castle, 235.
Awaous crassilabris, 84.
 puntangoides, 84.
Balistes bursa, 73.
 capistratus, 74.
 chrysopterus, 73.
 flavimarginatus, 73.
 fuscus, 73.
 niger, 73.
 vidua, 73.
Balistapus aculeatus, 74.
 rectangulus, 74.
 undulatus, 74.
 verrucosus, 74.
Belone annulata, 12.
 platura, 12.
Blackman, L. G., resigns, 93.
Bone house at Moanalua, 130.
Borabora petroglyphs, 294.
Botanical accessions, 1909, 231.
 1910, 305.
Brassica campestris, 326.
Brighan, W. T.:—
 Annual Report, 1907, 93.

- Brigham, W. T.:—
 1908, 179.
 1909, 227.
 1910, 303.
 Curved adzes, 255.
- Bryan, W. A.:—
 almost drowned, 150.
 Birds of Molokai, 133.
 departs, 93.
 hunts the uau, 137.
- Buda marina, 325.
- Buddleia asiatica, 330.
- Cæsalpinia sappan, 327.
- Cæsio cæruleureus, 44.
 lunaris, 44.
- Cæsio teres*, 45.
- Callyodon balinensis, 60.
 bataviensis, 60.
 celebicus, 60.
 cyanognathus, 60.
 dimidiatus, 60.
 dubius, 59.
 dussumieri, 62.
 erythron, 62.
 fasciatus, 62.
 lacerta, 60.
 lepidus, 60.
 macrocheilus, 60.
 moensi, 63.
 oviceps, 63.
 pentazonus, 60.
 pyrrhostethus, 60.
 quoyi, 62.
 strongylocephalus, 60.
 ultramarinus*, 63.
 unicolor, 60.
 waitei*, 60.
- Canthigaster compressus, 79.
 solandri, 79.
- Caranx forsteri, 32.
 lugubris, 32.
 melampygus, 32.
- Carcharias sorrah, 4.
- Carduus lanceolatus, 332.
- Carpodacus mexicanus, 148.
- Cartwright, B. Jr., loans collection, 309.
- Carved stone lamp, 127.
- Cassia chamæcrista, 327.
 lævigata, 327.
- Casts of fishes, 113.
- Cephalopholis argus, 34.
 miniatus, 35.
 urodelus, 34.
- Ceremony at taking of fish, 210.
- Ceropteris calomelanos, 324.
 chrysophylla, 324.
- Cestrum diurnum, 331.
- Chætodon auriga, 64.
 citrinellus, 65.
 ephippium, 65.
 flavirostris, 64.
 gahhm, 66.
 lineolatus, 64.
 lunula, 64.
 ornatissimus, 65.
 pelewensis, 64.
 reticulatus, 65.
 semeion, 65.
 setifer, 64.
 ulietensis, 64.
 unimaculatus, 65.
 vagabundus, 64.
- Cheilinus digrammus, 58.
 fasciatus, 58.
 trilobatus, 59.
- Cheilio inermis, 57.
- Chlorodrepanis kalaana, 160.
- Chœrops macrodon, 55.
- Chromis axillaris, 55.
 cæruleus, 55.
- Chrysanthemum leucanthemum, 333.
- Cirsium lanceolatum, 332.
- Cnicus lanceolatus, 332.
- Conchological accessions, 1907, 104.
 1908, 186.
 1909, 231.
 1910, 304.
- Connelly collection, 228, 235.
- Convolvulus peltatus, 331.
- Cooke, C. M.: Accessions of Pulmonata, 231.

- Coris annulatus*, 57.
 ayula, 56.
 caudimaculatus, 57.
Coryphopterus criniger, 84.
Corythoichthys sealei, 17.
 waitei, 17.
Crepis japonica, 323.
Crotalaria saltiana, 327.
 sericea, 327.
 spectabilis, 327.
 striata, 327.
Ctenochaetus striatus, 67.
Curved adzes, Brigham, 255.
Cypselurus oligolepis, 15,
 *tahitensis**, 13.

Dascyllus aruanus, 55.
 melanurus, 55.
*Deleastes dæctor**, 81.
Deverill collection purchased, 99.
 list of, 183.
Director's report, 1907, 93.
 1908, 179.
 1909, 227.
 1810, 303.
Dole, S. B., leaves the Board, 179.
Drepanorhamphus funereus, 148.
Drymaria cordata, 325.

Echidna amblyodon, 12.
 polyzona, 12.
Eleotris fusca, 84.
Emilia flammea, 333.
Epibulus insidiator, 55.
Epilobium billardierianum, 329.
Epinephelus cæruleopunctatus, 36.
 corallicola, 35.
 dæmelii, 36.
 fasciatus, 36.
 maculatus, 35.
 merra, 35.
 pachycentrus, 36.
 undulosus, 35.
 *zapyrus**, 36.
Erodium cicutarium, 328.
Erysimum officinale, 326.

Erythræa centaurium, 330.
Ethnological accessions, 1907, 101.
 1908, 183.
 1909, 235.
 1910, 306.
Eupatorium sp., 333.
*Euphorbia rockii**, 214.
Europterygius xanthopterus, 11.
Exchange lists, 1907, 110.
 1908, 196.
 1909, 251.
 1910, 320.
*Exocarpus luteolus**, 296.
Exocætus volitans, 15.

Fish ponds, 199, 207.
Fish traps, Stokes, 199.
Fish weirs, 199.
 possible origin, 206.
Fishing by weirs, 199, 206.
Fishing, superstitions, 209, 211,
Fistularia depressa, 17.
 petimba, 17.
Fleminga abrupta, 328.
 bracteata, 328.
 fruticulosa, 328.
 strobilifera, 328.
Fœniculum vulgare, 330.
 fœniculum, 330.
Foot-prints cut in stone, 278, 286, 289.
Forbes, Chas. N.:—
 Appointed, 179.
 New plants, I, 213.
 New plants, II, 296.
 Naturalized plants, 323.
 report herbarium, 305.
Forcipiger longirostris, 64.
Fornander, Stokes index to, 180.
Fregata aquila, 144.
Fulica alai, 145.

Gallinula sandvicensis, 145.
Gentiana centaurium, 330.
Geological specimens, 237.
Geranium carolinianum, 329.
 cticutarium, 328.

- Gnathodentex aurolineatus*, 45.
Gobius oligolepis, 84.
 ornatus, 84.
Gomphosus tricolor, 58.
Grammistes sexfasciatus, 38.
Gymnogramma calomelanos, 324.
Gymnogramme calomelanos, 324.
Gymnothorax chalazius, 10.
 detactus, 6.
Gymnothorax favagineus, 7.
 flavomarginatus, 9.
 *marquesensis**, 10.
 nebulosus, 6.
 nubilis, 7.
 pictus, 6.
 rhodocephalus, 6.
 *tahitensis**, 7.
 tenebrosus, 7.
 thyrsoides, 9.
 *zonipectis**, 7.

Halichæres centiquadrus, 56.
 modestus, 56.
 notophthalmus, 56.
 scapularis, 56.
 solorensis, 56.
 trimaculatus, 56.
Halophylla ovalis, 324.
 ovata, 324.
Hawaiian petroglyphs, 257, 284.
Heliosciadium leptophyllum, 329.
Hemigymnus melapterus, 55.
Hemiramphus affinis, 13.
 *australensis**, 12.
 commersoni, 13.
 eclancheri, 13.
 melanurus, 13.
 platurus, 13.
Heniochus chrysostomus, 65.
 permutatus, 65.
Hepatus achilles, 66.
 elongatus, 66.
 guttatus, 67.
 lineatus, 66.
 nigricans, 66.
 olivaceus, 66.
 triestegus, 66.

*Hesperomannia lydgatei**, 220.
Higgins, Miss E. B., appointed Librarian, 304.
Hilo petroglyphs, 278.
Himantopus knudseni, 145.
Himatione sanguinea, 158.
Hina, 203, 210.
Holacanthus cyanotis, 65.
 diacanthus, 66.
Holacanthus flavissimus, 65.
 imperator, 65.
 lineolatus, 65.
 loriculus, 65.
 permutatus, 65.
Holocentrus diadema, 24.
 diploxiphium, 24.
 ensifer, 20.
 lacteguttatus, 20.
 microstomus, 24.
 opercularis, 24.
 pæcilopterus, 24.
 praslin, 20.
 punctatissimus, 24.
 rubellio, 22.
 spinifer, 20.
 tiere, 24.
 tiereoides, 20.
 verticalis, 22.
Hologymnosus semidiscus, 57.
Holosteum cordatum, 325.
Hypochæris radicata, 333.

Insect collections, 298.
Ipomæa cryseides, 331.
 glaberrima, 331.
 grandiflora, 331.
 peltata, 331.

Julis pulcherima, 57.

Kakawahia, 164.
Kalaina wawae, 286.
Kamalalawalu, 259, 269, 273.
Kau petroglyphs, 273.
Kauai petroglyphs, 257, 291.
Kauaia, *Kauwala*, 130.
Kohala petroglyphs, 279.

- Kona petroglyphs, 259.
 Kuhlia malo, 34.
 tæniura, 34.
 Kuula, 203, 209, 211.
 Kyphosus cinerascens, 47.

 Lapsana communis, 333.
 Lemna minor, 324.
 Leontodon taraxicum, 333.
 Lepidaplois axillaris, 55.
 Leptecheneis flaviventris*, 83.
 Lethrinus harak, 47.
 leutjanus, 47.
 mahsena, 47.
 moensii, 47.
 Leucanthemum vulgare, 333.
 Library accessions, 1907, 105.
 1908, 186.
 1909, 238.
 1910, 310.
 Liliuokalani loans, relics of chiefs,
 309.
 Liza waigiensis, 15.
 Lo vulpinus*, 71.
 Loko, 199.
 Lophortyx californica, 146.
 Lutianus bengalensis, 43.
 bohar, 44.
 fulviflamma, 43.
 fulvus, 40.
 fuscescens, 43.
 gibbus, 41.
 marginatus, 41.
 melanesiæ*, 43.
 monostigma, 40.
 nukuhivæ*, 40.
 russellii, 43.
 semicinctus, 43.
 tahitiensis*, 40.
 Lysimachia longispala*, 222.

 Macropharyngodon meleagris, 56.
 Malva caroliniana, 329.
 Mapo soporator, 84.
 Medicago apiculata 328.
 denticulata, 328.
 intertexta, 328.

 Megalops cyprinoides, 4.
 Melilotus indica, 328.
 minima, 328.
 parviflora, 328.
 regulosa, 328.
 Merinthe haplodactyla, 79.
 Micranous hawaiiensis, 137.
 Modiola caroliniana, 329.
 multifida, 329.

 Moho bishopi, 170.
 Molokai birds, Bryan, 133.
 Molokai petroglyphs, 257, 284, 290.
 Momordica charantia, 332.
 Monacanthus fatensis*, 74.
 spilosomus, 75.
 Monotaxis grandoculis, 46.
 Moorings drilled in boulders, 273.
 Moringua javanica, 12.
 Mugil cephalus, 17.
 kelaartii, 15.
 Mulloides auriflamma, 48.
 flammeus, 48.
 ruber, 48.
 samoensis, 47.
 Munia nisoria, 148.
 Myripristis adustus, 26.
 microphthalmus, 28.
 murdjan, 26.
 phæopus*, 28.
 sanguineus*, 26.
 Myxus leuciscus, 15.

 New Hawaiian plants, Forbes, 213.
 Nicotiana tabacum, 331.
 Niihau petroglyphs, 293.
 Nycticorax nycticorax nævius, 145.

 Oahu petroglyphs, 257, 258, 290.
 Odontogobius phalæna, 84.
 Olomao, 171.
 Oreomystis flammea, 164, 167*.
 Ornithological accessions, 1907, 103.
 Ostracion auricauda*, 77.
 chryseres*, 75.
 cornutum, 75.
 dexteri*, 75.

- Ostracion lentiginosum*, 79.
 renardi, 77.
 sebae, 77.
 tuberculatum, 77.
Ou, 166.

Pakule, 201.
Palmeria dolei, 158.
Pa makiawa, 201.
Paracanthistius maculatus, 35.
Paracirrhites forsteri, 51.
Paramia quinquelineata, 33.
Parapercis xanthozona, 86.
Pardachirus pavonius, 86.
Passiflora edulis, 329.
 foetida, 329.
Pelor didactylura, 83.
Pempheris mangula, 32.
Pentapus vittatus, 46.
Periophthalmus barbarus, 84.
Petroglyphs, Borabora, 294.
 cutting, 261.
 Hawaii, 2575, 284.
 Hilo, 278.
 Kau, 273.
 Kauai, 257, 291.
 Kohala, 279.
 Kona, Hawaii, 259.
 Molokai, 257, 284, 290.
 Niihau, 293.
 Oahu, 257, 290.
 Puna, 278.
 Stokes, J. F. G., 257.
 Tubuai, 293.
Petroscirtes rhinorhynchus, 89.
 tapeinosoma, 89.
*Phæornis rutha**, 171.
Phaëthon leptopus, 144.
Phallic emblem, 266.
Phallic stone ♀, 101.
Pharopteryx nigricans, 38.
Phasianus versicolor, 146.
 torquatus, 146.
Plantago lanceolata, 332.
Platax orbicularis, 63.
Platophrys mancus, 86.
PlatyGLOSSUS marginatus, 56.

Plotosus anguillaris, 12.
Polycarpon tetraphyllum, 325.
Polydactylus plebeius, 18.
Pomacentrus cyanospilus, 52.
 lividus, 52.
 nigricans, 52.
 notophthalmus, 52.
 pavo, 52.
 scolopsus, 52.
 teinurus, 52.
Pomacentrus tripunctatus, 52.
Portulaca flava, 325.
 lutea, 325.
Priacanthus cruentatus, 38.
 hamruhr, 38.
Pristiapogon, koilomatodon, 33.
 snyderi, 33.
*Promethichthys pacificus**, 28.
Prunella vulgaris, 331.
Pseudupeneus, aurantiacus, 48.
 barberinus, 49.
 bifasciatus, 51.
 chryserydros, 51.
 moana, 48.
 pleurospilos, 51.
 porphyreus, 51.
Psittirostra psittacea, 166.
Pterois antennata, 83.
Pueo nesting, 146.
Puffinus newelli, 143.
Puna petroglyphs, 278.

Querimana crenilabris, 15.

Ranunculus hawaiiensis, 326.
 mauiensis, 326.
 parviflorus, 326.
Rhaphanus sativus, 326.
Relics of chiefs, 238, 309.
Reports, Director's, 1907, 93.
 1908, 179.
 1909, 227.
 1910, 303.
Rosa sp., 327.
Rubus jamaicensis, 327.
Rumex acetosella, 324.
 patentia, 325.

- Salarias azureus**, 87.
 *cæsius**, 88.
 caudolineatus, 87.
 coronarius, 86.
 edentulus, 86.
 hasselti, 84.
 lineatus, 86.
 marmoratus, 87.
 meleagris, 86.
Salarias quadricornis, 86.
 *tubuensis**, 87.
Sardinella kunzei, 5.
Saurida gracilis, 5.
Scarichthys auritus, 59.
 cœruleopunctatus, 59.
 *rarotongæ**, 59.
Schupp, Miss E.—
 appointed, 93, 98.
 resigns May, 1910, 304.
Scolopsis, bilineata, 45.
 monogramma, 45.
 temporalis, 45.
 trilineata, 45.
Scorpæna cooki, 79.
Scorpænopsis quiescens, 80.
Sculpture in relief, Stokes, 221.
Scuticaria marmorata, 12.
 tigrina, 11.
Seale, A., *Fishes of S. Pacific*, 3.
Sebastapistis, baillieui, 80.
 guamensis, 80.
 strongensis, 80.
Senecio vulgaris, 334.
Shark pen, 201, 212.
Sherardia arvensis, 332.
Siganus doliatus, 69.
 marmoratus, 71.
 rostratus, 67.
 *shortlandensis**, 69.
 striolatus, 69.
 verrucosus, 69.
 *zoniceps**, 69.
Sison ammi, 329.
Sisymbrium officinale, 326.
 Skylark common on Molokai,
 147.
Solanum sodomæum, 332.
Spergularia media, 325.
 salina, 325.
Spheroides hypselogenion, 79.
 oblongus, 79.
*Sphyræna goodingi**, 18.
 obtusata, 18.
Spilopelia chinesis, 146.
Stethojulis casturi, 56.
Stokes, J. F. G.:—
 Hawaiian Petroglyphs, 257.
 Stone sculpture in relief, 121.
 Walled Fish-traps of Pearl Har-
 bor, 199.
Stolephorus delicatulus, 5.
Stone sculpture in relief, 121.
Sturtevant, H. F. dies, 93.
Superstitions of fishermen, 209, 211.
Swezey, O. H.:—
 Insect collections in Museum, 298.
 appointed, 93.
Synanceia, verrucosa, 81.
Synodus varius, 5.

Taraxicum dens-leonis, 333.
 officinale, 333.
Terapon jarbua, 45.
Tetragonia cornuta, 334.
 expansa, 334.
 halimifolia, 334.
 inermis, 334.
 quadricornis, 334.
Tetraodon aerostaticus, 79.
 immaculatus, 79.
 lachrymatus, 79.
 setosus, 79.
Thalassoma, aneitense, 57.
 dorsale, 57.
 duperreyi, 57.
 fuscum, 57.
 lunare, 57.
 punctatum, 57.
 schwanefeldii, 57.
 umbrostigma, 57.
Thalliurus chlorourus, 58.
Thunbergia alata, 332.
 aurantiaca, 332.
Tissa marina, 325.

Trachinocephalus myops, 5.

Trifolium indicum, 328.

melilotus, 328.

repens, 328.

Toxotes jaculator, 63.

Trachurops crumenophthalmus, 30.

Trachyrhamphus sp., 17.

Tubuai petroglyphs, 293.

Tylosurus chorum, 12.

giganteus, 12.

Uau, 137.

Upeneus vittatus, 51.

Uropterygius concolor, 11.

Variola louti, 35.

Vestiaria coccinea, 155.

*Viola helena**, 218.

*oahuensis**, 216.

Walled Fish-traps, 199.

Westervelt, Rev. W. D., gives Mexican antiquities, 304.

Xanthichthys rivulatus, 73.

Xystæma argyreum, 51.

Yap money*, 102.

Zanclus canescens, 66.

Zebrasoma flavescens, 67.

veliferum, 67.

Zinnia pauciflora, 333.

N
70
53

OCCASIONAL PAPERS

OF THE

BERNICE PAUAAHI BISHOP MUSEUM OF
POLYNESIAN ETHNOLOGY AND
NATURAL HISTORY.

VOL. IV.—No. 5.

Director's Report for 1910.

WITH

INDEX TO VOL. IV.

HONOLULU, H. I.
BISHOP MUSEUM PRESS.

1911

BOARD OF TRUSTEES

ALBERT F. JUDD.....	President
E. FAXON BISHOP.....	Vice-President
J. M. DOWSETT.....	Treasurer
ALFRED W. CARTER.....	Secretary
HENRY HOLMES, SAMUEL M. DAMON, WILLIAM O. SMITH	

MUSEUM STAFF

WILLIAM T. BRIGHAM, Sc.D. (Columbia).....	Director
WILLIAM H. DALL, Ph.D.	Honorary Curator of Mollusca
JOHN F. G. STOKES.....	Curator of Polynesian Ethnology
C. MONTAGUE COOKE, Ph.D. (Yale).....	Curator of Pulmonata
OTTO H. SWEZEY.....	Honorary Curator of Entomology
CHARLES N. FORBES.....	Curator of Botany
JOHN W. THOMPSON.....	Artist and Modeler
MISS E. B. HIGGINS.....	Librarian
JOHN J. GREENE.....	Printer
AUGUST PERRY.....	Assistant Printer

JAMES KALEI.....	Janitor
WILLIAM AIPU.....	Janitor

PUBLICATIONS OF THE BERNICE PAUAAHI BISHOP MUSEUM

(All previous price lists are hereby cancelled.)

A Handbook for the Bishop Museum. Oblong octavo, 94 half-tone illustrations. Price 25 cts., postage 9 cts.

Index to Abraham Fornander's "Polynesian Race." By John F. G. Stokes. Price \$1.75, postage 5 cts.

Occasional Papers, Vol. I. Octavo.

No. 1. Director's Report, 1898. Visits to Ethnological museums in a journey around the world. [Out of print.]

No. 2. Director's Annual Report, 1899. Mat Sails of the Pacific—Stokes. Ray-skin Rasps—Walcott. Notes on the Birds of Oahu—Seale. Price 50 cts., postage 4 cts.

No. 3. Director's Annual Report, 1900. Visit to the American museums—Stokes. Mission to Guam—Seale. Notes on the Birds of Kauai—Bryan and Seale. Price \$1.00, postage 8 cts.

No. 4. New Hawaiian Fishes—Seale. Price 25 cents; postage 2 cts.

No. 5. Director's Annual Report, 1901, and Index to Vol. I. Illustrations of sperm whale and bird groups. Price 50 cts., postage 4 cts.

Occasional Papers, Vol. II.

No. 1. Director's Annual Report, 1902. Noteworthy Hawaiian Stone Implements—Brigham. Fibres of the Hawaiian Islands—Blackman. Distribution and Variation of *Achatinella multizonata*—Cooke. Monograph of Marcus Island—Bryan. Price \$1.00, postage 7 cts.

No. 2. Director's Annual Report, 1903. Remarks on Phallic Stones from Rapanui—J. L. Young. Aboriginal Wooden Weapons of Australia—Blackman. Price 40 cts., postage 4 cts.

No. 3. Director's Annual Report, 1904. Australian Bark Cance—Brigham. A Stone Dagger for Duelling—Brigham. Notes on the Birds of the Waianae Mountains—Bryan. Additional Notes on the Nesting Habits of the Hawaiian Owl—Bryan. Description of the Nest and Eggs of *Chlorodrepanis virens* (Gmel.)—Bryan. Notes on the American Birds Collected in the Hawaiian Islands by Mr. Gerrit Wilder—Bryan. A Bird's Nest of Pele's Hair—Bryan. Two Undescribed Nests and an Egg of a Hawaiian Bird—Bryan. Price 50 cts., postage 4 cts.

No. 4. Director's Annual Report, 1905. Three New Hawaiian Fishes—Bryan. Report of a Visit to Midway Island—Bryan. Nest of Hawaiian Hawk—Bryan. Price 50 cts., postage 3 cts.

No. 5. Director's Annual Report, 1906, and Index to Vol. II. Dr. Cooke's Report on Types of Hawaiian Land Shells. Price 20 cts., postage 3 cts.

Occasional Papers, Vol. III.

No. 1. Reprint of Original Descriptions of *Achatinella*. By E. W. Thwing. Price \$1.50, postage 9 cts.

No. 2. Notes on Hawaiian Land Shells—Pilsbry and Cooke. Price 25 cts., postage 2 cts.

(OVER)

PUBLICATIONS—Continued.

Occasional Papers, Vol. IV.

- No. 1.** Fishes of the South Pacific—Seale. Price \$1.00, postage 5 cts.
- No. 2.** Director's Annual Report, 1907. Casts of Hawaiian Fishes, made by John W. Thompson. Stone Sculpturings in Relief—Stokes. Some Birds of Molokai—Bryan. Price 75 cts., postage 5 cts.
- No. 3.** Director's Annual Report, 1908. Walled Fish Traps of Pearl Harbor—Stokes. Some New Hawaiian Plants—Forbes. Price 40 cts., postage 3 cts.
- No. 4.** Director's Annual Report, 1909. Hawaiian Curved Adzes—Brigham. Notes on Hawaiian Petroglyphs, I—Stokes. New Hawaiian Plants, II—Forbes. Summary of the Collection of Insects in the Museum—Swezey. Price 85 cts., postage 4 cts.
- No. 5.** Director's Annual Report, 1910, and Index to Vol. IV. Notes on the Naturalized Flora of the Hawaiian Islands—Forbes. Price 25 cts., postage 5 cts.

Memoirs, Vol. I. Quarto.

- No. 1.** Hawaiian Feather Work. By Wm. T. Brigham. Price \$2.50, postage 14 cts.
- No. 2.** Index to the Islands of the Pacific. By Wm. T. Brigham. Price \$1.50, postage 20 cts.
- No. 3.** Key to the Birds of the Hawaiian Group. By Wm. Alanson Bryan. Price \$1.50, postage 13 cts.
- No. 4.** Ancient Hawaiian Stone Implements. By Wm. T. Brigham. Price \$2.50, postage 20 cts.
- No. 5.** Supplement to Hawaiian Feather Work, with Index to Vol. I. By Wm. T. Brigham. Price 75 cts., postage 8 cts.

Memoirs Vol. II.

- No. 1.** Hawaiian Mat and Basket Weaving. By Wm. T. Brigham. —Hawaiian Nets and Nettings. By J. F. G. Stokes. Price \$3.00, postage 20 cts.
- No. 2.** Old Hawaiian Carvings—By Wm. T. Brigham. Price 50 cts., postage 5 cts.
- No. 3.** The Ancient Hawaiian House. By Wm. T. Brigham. Price \$3.00, postage 25 cts.
- No. 4.** The Volcanoes of Kilauea and Mauna Loa. By Wm. T. Brigham. Price \$3.50, postage 30 cts.

Memoirs, Vol. III.

- Ka Hana Kapa: The Making of Bark-Cloth in Hawaii.** By Wm. T. Brigham. With 29 color plates. Price \$12.50, postage 60 cts.

**THE UNIVERSITY OF MICHIGAN
GRADUATE LIBRARY**

DATE DUE

APR 19 1977

FOUND

JUL 18 1933

UNIV. OF MICH.
LIBRARY

UNIVERSITY OF MICHIGAN



3 9015 03472 7126

Filed by Preservation

BOOK CARD
DO NOT REMOVE

A Charge will be made

if this card is mutilated

or not returned

with the book

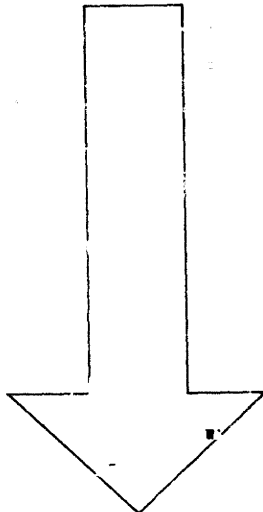


M-B11634

GRADUATE LIBRARY
THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN

BERNICE-PAJG
SERIALS

GL



6N-670.353-VU4-001
SERIALS

6L
SERIALS

BERNICE
PACIFIC
ISLAND
MUSEUM
OF
POLYNESIAN
ETHNOLOGY
AND
NATURAL
HISTORY
—
OCCASIONAL
PAPERS
4
1906-11

GN

670

.B.3

